

Appln No. 10/072,807

Amdt date June 2, 2004

Reply to Office action of December 2, 2003

Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1. (Previously Presented) An apparatus for transferring at least one part to be deposited on an immobilized pallet, comprising:

a transporter equipped with a gripping device and adapted to grasp the at least one part on a distributor, displace it from the distributor and deposit it in a positioning tool; and

a manipulator equipped with a gripper and adapted to grasp the at least one part in a precise position in the positioning tool, displace it from the positioning tool and deposit it in a precise position in a positioning receptacle carried by the immobilized pallet.

2. (Previously Presented) An apparatus as set forth in claim 1 wherein the distributor and the positioning tool are disposed at adjacent first vertical levels, while the positioning receptacle carried by the immobilized pallet is disposed at a second vertical level, below the first vertical level of the positioning tool.

3. (Previously Presented) An apparatus as set forth in claim 1 or 2 wherein the transporter comprises a mechanism having crossed movements, which is adapted to provide pilot-control of a carriage in two mutually perpendicular horizontal directions,

Appln No. 10/072,807

Amdt date June 2, 2004

Reply to Office action of December 2, 2003

and wherein the carriage carries a vertical actuator which supports the gripping device of the transporter.

4. (Previously Presented) An apparatus as set forth in claim 1 wherein the gripping device of the transporter comprises two movable jaws adapted to be moved towards each other to grasp the at least one part on the distributor and to be moved away from each other to deposit the at least one part in the positioning tool.

5. (Previously Presented) An apparatus as set forth in claim 1 wherein the manipulator comprises an actuator which carries and vertically displaces a support arm that is adapted to horizontally pivot over a limited angular range of selected value, and wherein the support arm supports the gripper of the manipulator to permit the gripper of the manipulator to be displaced by a combined movement of horizontal rotation and vertical translation.

6. (Previously Presented) An apparatus for transferring at least one part to be deposited on an immobilized pallet, comprising:

a transporter equipped with a gripping device and adapted to grasp the at least one part on a distributor, displace it from the distributor and deposit it in a positioning tool; and

a manipulator equipped with a gripper and adapted to grasp the at least one part in a precise position in the positioning tool, displace it from the positioning tool and deposit it in a

Appln No. 10/072,807

Amdt date June 2, 2004

Reply to Office action of December 2, 2003

precise position in a positioning receptacle carried by the immobilized pallet, wherein the manipulator comprises an actuator which carries and vertically displaces a support arm that is adapted to horizontally pivot over a limited angular range of selected value, and wherein the support arm supports the gripper of the manipulator to permit the gripper of the manipulator to be displaced by a combined movement of horizontal rotation and vertical translation and wherein the manipulator is connected to operational control means for effecting the following sequence of operations:

moving the gripper of the manipulator above the positioning tool;

actuating the gripper of the manipulator to pick up the at least one part in said positioning tool;

pivoting the support arm over said angular range;

displacing the support arm vertically without a change to its angular orientation to move the gripper of the manipulator above the positioning receptacle carried by the immobilized pallet;

actuating the gripper of the manipulator to deposit the at least one part in said positioning receptacle; and

moving the gripper again above the positioning tool for a fresh sequence of operations.

7. (Currently Amended) Apparatus as set forth in claim ~~5~~ 6 wherein said limited angular range is approximately 180°.

Appln No. 10/072,807

Amdt date June 2, 2004

Reply to Office action of December 2, 2003

8. (Previously Presented) Apparatus as set forth in claim 5 wherein the gripper of the manipulator comprises two movable jaws adapted to be moved towards each other to grasp the at least one part in the positioning tool and to be moved away from each other to deposit the at least one part in the positioning receptacle carried by the immobilized pallet.

9. (Previously Presented) Apparatus as set forth in claim 5 further comprising centering means adapted to effect precise mutual positioning of the gripper of the manipulator with both the positioning tool and with the positioning receptacle carried by the immobilized pallet.

10. (Previously Presented) Apparatus as set forth in claim 9 wherein the centering means comprises at least two male centering rods carried by the gripper of the manipulator and adapted to engage either into corresponding holes in the positioning tool or into corresponding holes in the positioning receptacle carried by the immobilized pallet.

11. (Previously Presented) Apparatus as set forth in claim 10 wherein the positioning tool is mounted floatingly on a fixed support by way of elastic means.

12. (Previously Presented) Apparatus as set forth in claim 10 wherein the positioning receptacle is mounted floatingly on the pallet by way of elastic means.

Appln No. 10/072,807

Amdt date June 2, 2004

Reply to Office action of December 2, 2003

13. (Previously Presented) Apparatus as set forth in claim 11 or 12 wherein the elastic means comprise elastic washers or legs.

14. (Currently Amended) Apparatus as set forth in An installation for the circulation of part carrying pallets comprising a transfer apparatus according to claim 1, wherein the at least one part is connected to a corresponding part carried by the immobilized pallet arranged to deposit a part on a pallet immobilised at the location of a station of the installation.

15. (Currently Amended) An apparatus for transferring at least one part to be deposited on an immobilized pallet, comprising:

a transporter equipped with a gripping device and adapted to grasp the at least one part on a distributor, displace it from the distributor and deposit it in a positioning tool; and

a manipulator comprising a support arm movable by an actuator and equipped with a gripper and adapted to grasp the at least one part in a precise position in the positioning tool, displace it from the positioning tool and deposit it in a precise position in a positioning receptacle carried by the immobilized pallet, wherein the manipulator is connected to operational control means for effecting:

moving the gripper of the manipulator above the positioning tool;

actuating the gripper of the manipulator to pick up the at least one part in said positioning tool;

Appln No. 10/072,807

Amdt date June 2, 2004

Reply to Office action of December 2, 2003

horizontally pivoting the support arm over a limited angular range;

displacing the support arm vertically without a change to its angular orientation to move the gripper of the manipulator above the positioning receptacle carried by the immobilized pallet;

actuating the gripper of the manipulator to deposit the at least one part in said positioning receptacle; and

moving the gripper again above the positioning tool for a fresh sequence of operations.

16. (New) Apparatus as set forth in claim 5 wherein said limited angular range is approximately 180°.

17. (New) An apparatus for transferring at least one part to be deposited on an immobilized pallet, comprising:

a transporter equipped with a gripping device and adapted to grasp the at least one part on a distributor, displace it from the distributor and deposit it in a positioning tool; and

a manipulator equipped with a gripper comprising at least two male centering rods, wherein the gripper is adapted to: grasp the at least one part in a precise position in the positioning tool by aligning the at least two male centering rods with corresponding centering holes in the positioning tool, displace the at least one part from the positioning tool, and deposit it in a precise position in a positioning receptacle carried by the immobilized pallet by aligning the at least two

Appln No. 10/072,807

Amdt date June 2, 2004

Reply to Office action of December 2, 2003

male centering rods with corresponding centering holes in the positioning receptacle.